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AUTHOR Macaranas, Federico M.
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ABSTRACT

The reduction of social inequalities through education is widely believed to be possible. In the past decade however, social scientists have increasingly questioned the posited conventional relationship between education and socio-economic equality. Factors other than the number of years and/or the quality of schooling have to be considered in explaining income levels, for example, labor market discrimination based on ethnic origin or sex. A review of three empirical studies was conducted focusing on: (1) the factors explaining income levels of Chinese, Filipino, and Japanese communities in the United States: (2) the educational attitudes and work/income opportunity perceptions of young Filipino Americans; and discrimination in the nursing labor market. With respect to the first study, school appears to be a highly significant explanatory variable for the incomes of Chinese, but not for either Filipinos or Japanese. The second study shows the effect of attitudinal factors, such as the consumption view of education prevalent in the Philippines, on the motivation to obtain higher education. Based on resumes sent in response to advertised job openings, the third study concludes that racial discrimination exists in the middle management market for nurses, and that the disadvantage of a non-Anglo name is more significant for those born here in the United States. (RLJ)

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EDUCATION AND INCOME INEQUALITY AMONG ASIAN AMERICANS

Federico M. Macaranas
Research Institute
School of Business
Manhattan College
New York City, New York

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Education and Income Inequality Among Asian Americans

Federico M. Macaranas
Research Institute
School of Business
Manhattan College
New York City, New York

The reduction of social inequalities through education is one basic tenet in meritocratic- and democratic-minded communities that is thought to have been continuously sharpened by the experience of several waves of migration into the U.S. For example, the difference in economic achievement between 19th-century Irish and Jewish migrants has been traced by Sowell (1975, p. 71) to the "reverence for learning" of the latter – that is in turn the consequence of their urban and commerical background that stand in sharp contrast to the rural and unskilled peasant roots of the former. It has been observed that Jewish immigrants crowded the public schools and libraries while such free education was neglected by many 19th-century immigrant groups.

The traditional peasant culture and the resulting barrier to higher education in Southern Italy is also used by Sowell to explain the material gap between the second wave of Italian immigrants to the U.S. compared to the bulk of the first wave in the 1870's who were from the more economically and educationally advanced northern part of the country. The same peasant background of most 20th-century Latin immigrant groups – the notable exception being West Indian Blacks – places a low value on education (evidenced by higher drop-out rates and attendance in earlier colleges and courses according to Sowell, p. 164) leading to relatively depressed incomes and living conditions.

In the past decades however, social scientists have increasingly questioned the posited conventional relationship between education and socio-economic equality. Researchers in the field of education searched extensively for the determinants of educability while economists concerned themselves with the effects of education especially on earnings differences.

This paper is an attempt to relate these two important policy variables in the context of recent Asian American experience. Since I am an economist by training, I will emphasize the earnings side of the education-income relation more than the determinants of educability which educators are more capable of analyzing. In Part I, I will present a general framework for examining the theoretical relationships imbedded in the education-income link and identify where some of the existing research on Asian Americans fits. In Part II, I will present three empirical studies pertinent to the issues thus raised: 1. the factors explaining income levels of the Chinese, Filipino, and Japanese communities in the U.S.; 2. the educational attitudes and work/income opportunity perceptions of young Filipino Americans in New York City; and 3. discrimination in the nursing labor market. All of these were completed recently; but I would like to consider them as ongoing projects since I intend to pursue their implications further with the help of anyone interested in the same research area.

PART I: THE GENERAL FRAMEWORK

Figure I depicts a general framework within which may be categorized the extensive literature produced by social scientists relating to education and income inequalities, be these within groups or between groups. At the heart of this figure is the education-income relation which is really not all that simple.[1] In fact, this figure is a highly abstract skeleton whch has left out, for example, the interaction of variables within sets and between sets.

Sets I and II refer to the "nurture" and "nature" determinants of educability; set I-A may affect income directly while set I-B has to pass through the educatonal attainment channel in order to affect income. Sets III and IV are factors intervening in the education-income relation, the former being exogenous or independent of education itself and the latter being a by-product of the educational process; set III variables may affect income levels directly without the need for linking from the educational attainment end. Sets III-B and III-C are alternative avenues of achieving higher income levels.

This figure shows that, contrary to the conventional wisdom, education may indeed be neither sufficient nor necessary for achieving higher income levels, whatever the norm may be. It is not sufficient because factors other than the number of years and/or the quality of schooling have to be considered in explaining income levels, e.g., labor market discrimination based on ethnic origin or sex. Education is not necessary because higher income levels may be achieved through non-formal education, such as on-the-job training, random factors, or even the passage of time alone.[2]

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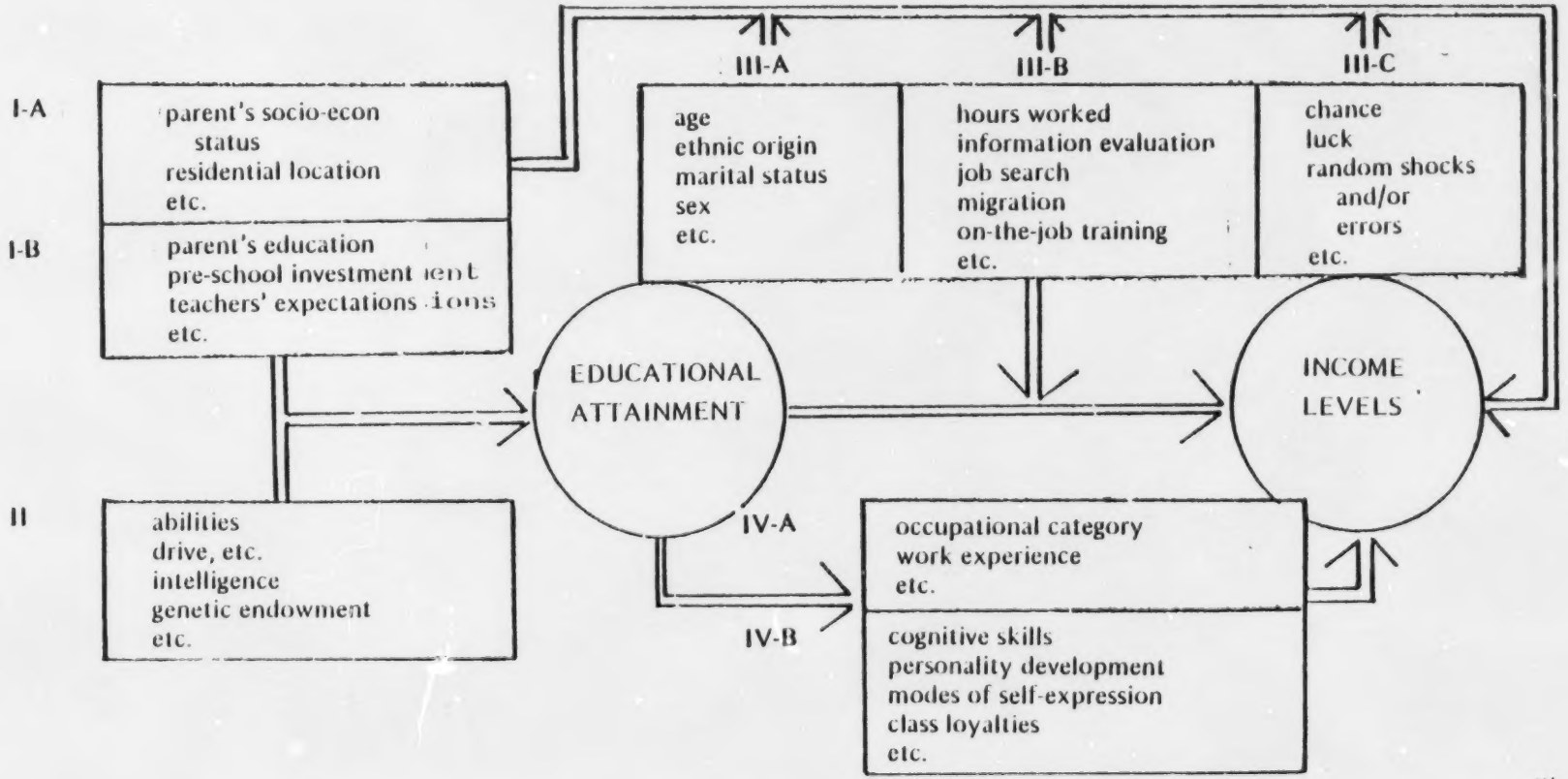
1. The educational process can be made very complicated as in Boardman, Davis and Sanday (1977) where six educational outputs are explained by 42 exogenous variables including demographics, family background, school and teacher characteristics, etc. An interesting result is that "Asian Americans have a very high achievement level, high motivation and expectations but low efficacy and perceived teachers' expectations. The low efficacy for Asian Americans may stem from their low individualized feelings of worthiness, although other studies show they have high group self esteem," (Boardman, et.al., p. 35).

2. McGouldrick and Tannen (1977) for example found that wage differentials between "new" and "old" immigrants before 1914 were not due to differences in worker skills or industry characteristics.

FIGURE I: A GENERAL FRAMEWORK OF THE EDUCATION-INCOME RELATIONSHIP



We can likewise use Figure I to analyze the basic research work concerning Asian Americans centering on the "model minority" thesis. This thesis in essence asserts that Asian Americans do not comprise a disadvantaged group because of their success in education and income, thus barring them from programs designed to help other minority groups like Blacks, Hispanics and Native American Indians (e.g., Carnegie Commission on Higher Education, as cited in Yoshioka, et. al., 1973).[3]

This thesis seems to rest on the narrow perspective of the education-income relation which seems to be deceivingly corroborated by census data. For example, Figures 11-A and II-B suggest that the conventional wisdom relating education and income appears valid on a straight cross-sectional or even on intergenerational cross-section basis. (Macaranas, 1977). However, this statistical relation does not explain whether Asian Americans have achieved their educational levels *because of* or *in spite of* the predetermining environmental variables as in sets I-A and I-B.

The focus is too output-oriented since it leaves out the socially germane question of the amount of inputs or resources used, especially work hours as against leisure hours. Hence it is appropriate to ask what costs, pecuniary and non-pecuniary (Suzuki 1977, p. 25, cites the latter), had to be borne by Asian Americans to attain their educational and income levels. It is evident from the census data that the high median family incomes of Asian American families may be attributed to the existence of more contributors to the coffers in terms of working members. It may also not be unreasonable to hypothesize that immigrants tend to work longer hours whenever possible if only to hasten their material advancement or even to maintain a subsistence level of living.

If higher education is pursued by Asian Americans despite unfavorable socio-economic background factors, then it is possible that they subscribe to the belief in the efficacy of an educational investment obtaining larger future income streams for them. This need not be viewed positively, however. For example, Suzuki hypothesizes that this belief may have been instigated by the inability of Asian American migrants in the early 20th-century to enter craft and other unions and most white-owned businesses: "Since very few other options existed, they very likely saw schooling as one of the only avenues left for their children's upward mobility. This almost desperate faith in schooling was undoubtedly reinforced by the traditional veneration accorded to education in Asian societies" (Suzuki 1977, p. 44). From Figure I this means that these early migrants were denied other paths to higher incomes like effective job search, migration, on-the-job training, etc.

This sociological hypothesis of Suzuki is quite distinct from the postulate of the so-called human capital theorists in economics that "investment in oneself is the result of rational optimizing decisions (by individuals or their parents) made on the basis of estimates of probable present value of alternative life-cycle income streams, discounted at some appropriate rate" (Sahota, 1978, pp. 11-12). This simply says that individuals wittingly or unwittingly attempt to maximize their future total incomes by going to school.

I am inclined to believe that the kind of education received by the early immigrants and of those who came here recently, especially by virtue of marriage and consanguinity to professionals, are not of the investment type as propounded by human capital theory which precludes them from obtaining higher earning levels when they reach the more advanced

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3. Boardman, Davis and Sanday, *ibid.*, also notes with reference to the six educational output variables cited in footnote 1 above: "Blacks have all of these endogenous variables working to increase their achievement although their actual performance as a group lags considerably behind that of Asian Americans and Whites," p. 35.

U.S. economy. Pertinent to the Filipino experience, may I note the observations made by economists (Roxas, 1965; Cheetham and Hawkins, 1976) that the low-cost fields of study in the Philippines – liberal arts, commerce, business administration, teacher training – are precisely the areas served by profit-motivated private schools which comprise the larger share of the market for higher education there. Moreover, "in a country where the diploma is more important than the educational discipline, these would also be the most attractive areas for students who desire the status symbol and prestige of a college education since these can be purchased here at the lowest price" (Roxas, 1965, p. 93).

I submit that this consumption type of education as contrasted to the investment type may have severe consequences once transmitted to the offspring of immigrants. Juanita Tamayo-Lott (1976, p. 10) observes: "Like other socio-economic groups striving for upward mobility, the Philippine-American is interested in immediate and tangible rewards. 'Why waste four years of earning power to get a piece of paper?' is not an atypical response from immigrant generation parents." I suspect that she is referring to parents who may have been exposed to minimum schooling or to consumption type education that places a premium on a diploma for prestige and status symbol only. This weakens an educability factor in set I-B.

The preceding arguments can be viewed through the occupational category link between education and income in set IV-A in Figure I. Since there is a lower probability of getting quality education for the consumption type in contrast with the investment type, the occupational achievement of most immigrants from the Philippines (except professionals admitted in the third and sixth preference categories) may be expected to lead to relatively lower incomes.

Peter Chi (1972) documents this important link between education and income in his study using 1960 census data, p. 121:

> "The occupational achievement of a group is the most influential factor in determining the group's income level. This is because occupation provides the major and direct source of income. In the labor market, Blacks, Spanish surnames, Indians, Filipinoes (sic) and some first generation ethnic groups were disproportionately represented in lower rungs of the job hierarchy and underrepresented in skilled business and professional positions. . . Education is often prescribed as a remedy for the ills of poverty. However, this model shows that education affects income only indirectly through its influence on occupation. The clear meaning of this is that education alone is not enough to equalize intergroup income inequality."

Unfortunately, the solution for this may generate a population explosion among Asian Americans because it is the marital status control variable which Chi found to affect greatly the mean income difference of Asians with the standard group.

Many other studies have focused on the occupational achievement link but let me cite one only. A DHEW field survey of Asian Americans in low-income urban areas in Fall 1973 (Department of Health, Education and Welfare, 1977) suggests that most of those who only had high school education stay in sales and clerical jobs, etc., and do not move up to the professional/managerial occupational category. However the number of school years completed does not explain why, for example, 76% of the Pilipino family heads and 53% of the Chinese family heads who had college degrees were also working in these lower status sales, clerical and service jobs. In fact, the study explicitly recognizes that a college degree need not ensure living in a high-income area.

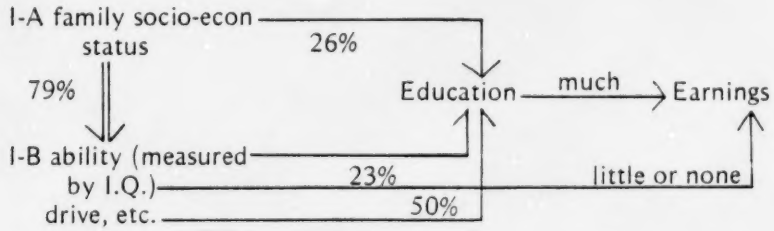
What could be the reasons for this? Only the original data can show whether these are factors in I-A, III-A or IV-A but these are unpublished. However, the published data show that for the Pilipino sample, the consumption type of education appears as one plausible explanation. Since only 9% are native-born and only 6% are educated in the United States solely or partly, this sample suggests a large percentage of new immigrants (in fact 72% immigrated after 1966) whose education stopped in the Philippines. Some 95.2% of Pilipinos 14 years and over and out of school never pursued higher education in the U.S.; in contrast, similar percentages for Chinese and Japanese are 90.9% and 66.0% respecitvely. This survey is a rich source of data that can be studied using multivariate regression analysis, a powerful analytical technique not too frequently used by researchers of Asian American problems.[4]

Focusing attention now on the intervening variables in IV-B of Figure I, Suzuki (1977) notes that these variables are utilized by Bowles and Gintis in their criticism of the meritocratic thesis conventionally associated with the education-income relation. These two economists found that in the U.S. personal income depends primarily on educational level and family socio-economic background, but not on cognitive skills. Using Figure I, the channels of first entry are not through IV-B but through I-A and education itself.

However, Bowles and Gintis argue that the early socialization of the person tends to be reinforced in school and thus produce the remaining intervening variables in IV-B. It is upon this last idea that Suzuki constructs his Proposition I – that schools selectively reinforce certain Asian American cultural behavior patterns and inculcate others "that are deemed 'appropriate' for lower echelon white-collar wage workers."

The general framework in Figure I was purposely presented to accommodate propositions like these (Proposition I above flows from I-A to IV-B) but both this proposition and the general framework remain to be translated into empirically testable relations or systems of relations for the Asian American experience. This is an enormous challenge to interdisciplinarians and specialists alike. In fact, I know of only one work that takes this general perspective for the entire U.S. population.

It is an econometric work by Griliches (reported in Sahota, p. 32), with a simultaneous equations model of income inequality combined with family background (I-A), ability (I-B), education and earnings variables. Following Sahota's presentation of the major results, Griliches estimates the relationships as follows:



It is evident from the above that family background variables have significant influence on measured ability and schooling but ability affects earnings indirectly through schooling. Note that this model reaffirms the conventional wisdom that there is a direct and significant relation between education and income.

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4. This is also the criticism that George Sabagh raises in his book reviews of Betty Lee Sung, *A Survey of Chinese American Manpower and Employment*, and George Wilber, et. al., *Orientals in the American Labor Market*. See Sabagh (1978). Multivariate regression analysis enables a researcher to isolate the pure effect of a factor on a dependent variable.

PART II: SOME EPIRICAL STUDIES

In this section, I will be reviewing some of the relationships found in the general framework which I have empiricized in two studies (Macaranas, 1978; Macaranas, 1979). As will be evident later, the models underlying these empirical studies are not of the general theory as attempted by Griliches; hence, they are pieces of a jigsaw puzzle which future researchers may fit together in order to explain the complicated interrelations of education and income.

The first is an attempt to explain the levels of incomes of the three major Asian American groups by factors in set III-A (age, sex), and III-B (hours worked) and the median schooling variable. The second explores the attitudes of young Filipino Americans in New York City towards education and their perception of work and income opportunities, in effect tying together variables in II with education and income in an ex-ante sense. The third concentrates on the labor market in nursing, especially with regards to potential sources of discrimination against Asian Americans through the occupational category in set IV-A.

Section A

Regression Models of Income and Education of Three Asian American Groups

From the macro profile above, some of the variables that are needed for a more rigorous estimation of the relationship among education, income, and socio-economic variables have been identified. These will now be analyzed more rigorously but data available for this project percludes earnings functions calculations as typically presented in the economics literature. This requires observations for individuals rather than summary statistics stratified in various ways as may be found in the Bureau of Census 1970 Census of Population publications (hereafter referred to as PC(2)-1G).[5] The following regression models and analyses are therefore limited to group mean or median earnings rather than individual earnings.

There are seven age brackets for both males and females in PC(2)-1G from which can be extracted socio-economic data for three major Asian American groups: Chinese, Japanese, and Filipinos. The use of these age cohorts appears to be the only possible cross-section method that can generate macro relationships from the published statistics. The regression models have for their dependent variable mean or median income or its logarithmic transformation. The independent variables are: education, a dummy variable for sex, labor force participation variables, and other socio-economic data.

Only the results of one of the multivariate regression models will be discussed here at great length since the rest merely support the major findings of this particular version of the income and education relationship. The selected model's independent variables are MEDSCH (median school years completed), SEXDUMMY (dummy variable for sex where males = 1 and females = 0) AGE AND AGESQ (quadratic formulation of the bracket midpoint age variable consistent with concave earnings—age profiles suggested by the literature), and %WTSWL (percentage that worked twenty-six weeks or less in the given age bracket). The latter controls for full- or part-time job considerations which stepwise regression models single out as most important among other labor force characteristics in explaining income levels.[6] (See Appendix A, Tables A-3 to A-5 for these variables. Note that these tables indicated a 10% difference between the sexes in this variable for all three ethnic groups.)

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5. The 1970 Census 5% public use sample has a 1% sample tape with over 6000 Filipinos but this was not available for the present research.

6. Stepwise regression models for all three ethnic groups, not reported in detail here rank %NOTINL (percentage not in labor force) and %PTKMA (percentage in professional, technical, kindred workers; managers and administrators except farms) as next in ability to reduce the proportion of variance the most.

The results for the untransformed and logarithmic versions of the dependent variables are presented in Table I; details of the logarithmic income regressions may be found in the Appendix as Table A-6. The independent variables are untransformed data. The most interesting results from Table I can be identified as follows:

(1) MEDSCH appears to be a highly significant explanatory variable for the log of the incomes of Chinese but not for either Filipinos or Japanese: not only are the coefficients for them small, they are also statistically insignificant. This may help explain the low enrollment of Filipinos in higher education in the U.S. because they may feel that it simply does not pay off to invest in more years of schooling to increase future earnings. The untransformed income models, however, show identically insignificant coefficents for all three groups. but there is a strong argument for not considering this result at all because of the superior statistical properties of transformed income data.[7]

(2) Age appears to be the most important variable for Filipinos in explaining income levels.

(3) The SEXDUMMY coefficients indicate generally lower female incomes due to sex considerations alone even after controlling for age, schooling, and full- or part-time work. (For the interpretation of dummy variables, see Part II.) The results here suggest that the income differential between the sexes is strongest among the Chinese largely due to differences in occupational achievement as Tables A-3 to A-5 show.[8]

(4) The %WTSWL variable appears with expected signs in all models. Again, the Chinese have the most significant coefficients while the Filipinos have the least, implying that the effect of part- or full-time work on incomes of the latter is not as pronounced as for the former.

Section B

Educational Attitudes and Work/Income Opportunities Perception of Young Filipino Americans

A survey of educational attitudes and work/income opportunity perception of young Filipino Americans in New York City was conducted in late Fall 1977 and early Winter 1978 to identify potential and actual barriers to higher education. Respondents were asked to answer a two part questionnaire, one part consisting of 48-questions and the other part requesting personal information (other than their names) from which were derived attitudinal indices and statistical tests relating these to the demographic factors culled from the completed forms.

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7. Joseph B. Kruskal, "Statistical Analysis: Transformation of Data," *International Encyclopedia of the Social Science*, Vol. XV, p. 182.

8. This result is upheld in regression models where age and %WTSWL are not present but in place of which are %PTKMA, %SINGL (percentage who are single), %PWS (percentage who are private wage and salary workers) and %SAMEH (percentage who lived in the same house in 1965). In the logarithmic income models, the %PTKMA is highly significant for Chinese (and Japanese, respectively), while the SEXDUMMY coefficients become insignificant (less significant, respectively) For Filipinos, the SEXDUMMY becomes in fact the most significant variable with coefficient values greater than for either Chinese or Japanese.

Table I: Summary of Results, Multivariate Regression, Models of Income
Filipinos, Chinese, and Japanese, 1970

	Filipinos		Chinese		Japanese	
MEDSCH	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
LMEDINC	0.0279	0.48	0.0700	2.84	0.0002	0.003
LMEANY	-0.1538	-0.94	0.1202	4.14	0.0378	0.527
MEDINC	18.72	0.08	-136.13	-0.65	-419.43	-0.809
MEANY	126.96	0.47	-100.80	-0.41	-358.20	-0.67-
AGE						
LMEDINC	0.0468	1.33	0.0263	0.92	0.0145	0.29
LMEANY	0.0117	0.12	0.0621	1.85	0.0197	0.38
MEDINC	247.20	1.73	-126.47	-0.52	265.96	0.71
MEANY	323.08	1.99	1.65	0.01	321.02	0.84
AGESQ						
LMEDINC	-0.0005	-1.56	-0.0003	-1.22	-0.0002	-0.54
LMEANY	-0.0004	-0.43	-0.0005	-1.61	-0.0002	-0.42
MEDINC	-2.80	-2.04	0.33	0.14	-3.5436	-0.98
MEANY	-3.39	-2.16	-0.76	-0.28	-3.8888	-1.05
SEXDUMMY						
LMEDINC	0.1154	0.74	0.1489	1.69	0.0782	0.52
LMEANY	-0.3490	-0.79	0.0987	1.32	0.1698	1.06
MEDINC	812.46	1.29	845.79	1.34	1472.40	1.27
MEANY	1217.28	1.69	1320.00	1.75	1946.42	1.64
%WTSWL						
LMEDINC	-0.0230	-2.99	-0.0168	-2.09	-0.0348	-3.38
LMEANY	-0.0268	-1.23	-0.0317	-4.66	-0.0266	-2.40
MEDINC	-36.31	1.16	-155.80	-2.70	-95.84	-1.20
MEANY	-22.45	-0.63	-139.10	-2.02	-83.89	-1.02

Notation:

LMEDINC - logarithm of median income.
LMEANY - logarithm of mean income
MEDINC - median income
MEANY - mean income

Tabular Student's t-values, 8 degrees of freedom = 0.706 at 0.25 Pr, 1.397 at 0.10 Pr, 1.860 at 0.05 Pr, and 2.896 at 0.01 Pr.

Fifty-five responses were received but 13 were discarded in later analysis due to incomplete answers to key questions. In this reduced sample, the mean age is 26.2 years. The respondents are predominantly Philippine-born (95%) , single (85%), reared in an urban place (71%), employed (76%) rather than in school (39%), and may thus be the typical new-wave, or post-1966, migrant. Of those in school, only 27% are full-time students; of those with a job, 63% work for at least 35 hours each week.

Fourteen indices were constructed from the questionnaire responses to represent variables pertinent to education, work/income opportunity perception. These indices have mean values of 3.00 because the Likert scale used is as follows: Strongly agree = 5, Agree = 4, Uncertain = 3, Disagree = 2, Strongly Disagree = 1, Not applicable = 0. Each index is derived from at least two equally-weighted question responses. These indices are:

(1) EDMOTIV: index of motivation to seek further education based on educational level desired, potential earnings and potential promotion in present work.

(2) PPRESS: index of peer pressure for education based on educational attainment of friends and opinions of family members.

(3) FINL: index of financial ease based on perceived net benefits of further education and other sources of support (relatives, private institutions, government).

(4) NON-INC: index of non-income reasons for further education based on improvement in social life and non-availability of training programs in the field of work of the respondent.

(5) DISCEXP: index of the feeling of being discriminated against in jobs based on ethnic origin, sex, and pay differentials.

(6) OVERDISC: index of opinion about overcoming discrimination based on higher education and motivations for work promotion.

(7) JOBSAT: index of work satisfaction based on personal assessment and perceived rating by superiors.

(8) DESHIY: index of the desire for higher income based on preferred income at present age, and expected income at this point of stay in the U.S.

(9) OTHERY: index of entrepreneurial interest based on the desire of being one's own boss.

(10) PATRON: index of job availability or promotion based on relatives or other personal contacts.

(11) GEOGMOB: index of geographic mobility for job-related reasons.

(12) NEWFIELD: index of desire to change fields of education or careers based on educational preparations in the Philippines or the U.S., opinion on the need for U.S. diploma, income potential, peer experience.

(13) JOBEXP: index of opinion on solid work experience in the Philippines or the U.S. as substitute for a U.S.-earned degree.

(14) EFFIC: index of efficacy, i.e., belief in one's ability to change things like working in a new field, self-study for work promotion, desire for more work responsibilities, health condition, entrepreneurial drive, ability to complain if underpaid.

In the empirical analysis that follows, any index with a value near three implies equal distribution of weighted attitudes on both sides of the "uncertain" scale, e.g., in Table II, the variable PATRON has a mean value of 3.098. On the other hand, the EDMOTIV index has a mean value of 3.844 suggesting that the group as a whole agrees to further their education based on their educational level desired, potential earnings, and potential promotion in present work.

This EDMOTIV mean value together with its standard deviation of 0.76 implies a more positive rather than a negative predisposition towards higher education. The remaining indices may be thought of as independent variables that explain such motivation. Since there are no *a priori* expectations regarding the importance of variables that motivate higher education, stepwise regression is used to rank the factors that influence EDMOTIV. From this exercise, the first seven variables/indices that reduced the proportion of variance the most are adopted as explanatory variables in several multiple regressions.

The results are very striking. The stepwise regression selected the following indices as the most important explanatory variables: EDMOTIV, DISCEXP, JOBEXP, OTHERY, EFFIC, FINL, DESHIY, and PATRON. Other than the intercept, the regression coefficients and t-values for EFFIC, DISCEXP, FINL, and OTHERY are the highest; the results are upheld in many multivariate regressions one of which is shown in Table V together with the stepwise regression results.

The negative EFFIC regression coefficients imply that those who believe in their ability to change things (pertinent to work and income opportunities) tend to be less motivated to pursue higher education. A one-point increase in the EFFIC index causes EDMOTIV to decline by more than a quarter of a point. However, the prob-value or the Pr (EFFIC would be as large as the value actually observed if H_0 were true, H_0: EFFIC does not decrease EDMOTIV) is between 0.25 and 0.10; this may be too high a probability for the null hypothesis to be accepted.[9]

On the other hand, the positive DISCEXP regression coefficient indicates that those who feel that discrimination exists in various forms have a positive outlook concerning higher education. Note that a one-point increase in the DISCEXP coefficient pulls up the EDMOTIV index by about a quarter of a point. Here the prob-value is between .05 and .025 and the H_0 may be comfortably rejected. Hence, it may be concluded that DISCEXP does affect EDMOTIV in this sample of young Filipino Americans.

The FINL index regression coefficient, like EFFIC, is negative and has a low prob-value in the multivariate model. However, the prob-value in the stepwise regression is much improved between .10 and .05 significance level. It cannot be concluded therefore that the perceived sources of financial support for further education and the net benefit derived therefrom affect EDMOTIV for the given sample.

OTHERY, the index of entrepreneurial interest, has a more significant positive regression coefficient than FINL or EFFIC and may really be considered as next in importance to DISCEXP. A one-point increase in OTHERY causes an increase of a fifth point in EDMOTIV with prob-value between .10 and .05.

The remaining variables in the 7-independent variables model (JOBEXP, DESHIY, and PATRON) are not too significant in prob-values or in terms of coefficient sizes.

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9. This is an alternative method to the classical test of hypothesis that is increasingly used by applied statisticians. The rule for prob-value is to reject H_0 if and only if prob-value . Thomas H. Wonnacott and Ronald J. Wonnacott, *Introductory Statistics for Business and Economics*, 2nd Edition (New York: John Wiley and Sons, 1977), p. 254.

Table II: Summary Statistics, Indices of Educational Attitudes and Work/Income Opportunities Perception of Young Filipino Americans

VARIABLE	MEAN	STD. DEV	STD.ERROR	MAXIMUM	MINIMUM	RANGE
EDMOTIV	3.844	0.757	0.106	5.00	1.67	3.33
PPRESS	4.206	0.697	0.096	5.00	2.50	2.50
FINL	3.125	0.765	0.107	4.50	0.00	4.50
NON-INC	3.225	0.737	0.103	5.00	1.50	3.50
DISCEXP	3.651	0.767	0.107	5.00	2.00	3.00
OVERDISC	3.980	0.916	0.128	5.00	0.00	5.00
JOBSAT	3.520	1.425	0.199	5.00	0.00	5.00
DESHIY	3.127	1.348	0.189	5.00	0.00	5.00
OTHERY	3.127	0.948	0.133	5.00	0.00	5.00
PATRON	3.099	0.819	0.115	5.00	1.00	4.00
GEOGMOB	2.510	1.139	0.159	4.50	0.00	4.50
NEWFIELD	3.114	0.641	0.090	5.00	1.60	3.40
JOBEXP	3.579	0.703	0.098	5.00	1.50	3.50
EFFIC	3.632	0.513	0.072	4.67	2.50	2.17

Table III: Stepwise Regression Results, EDMOTIV on Other Indices

DEPENDENT VARIABLE IS EDMOTIV

VARIABLE	REGRESSION COEFFICIENT	STANDARD ERROR OF COEFFICIENT	COMPUTED VALUE OF STUDENT'S T	BETA COEFFICIENT
DISCEXP	0.255	0.167	1.586	0.268
JOBEXP	-0.146	0.169	-0.863	-0.135
OTHERY	0.190	0.130	1.459	0.239
EFFIC	-0.273	0.264	-1.035	-0.185
FINL	-0.230	0.162	-1.421	-0.232
DESHIY	-0.068	0.106	-0.644	-0.121
PATRON	-0.125	0.147	-0.850	-0.135
NEWFIELD	0.098	0.213	0.462	0.083
NON-INC	0.085	0.186	0.455	0.083
OVERDISC	0.054	0.130	0.415	0.065
PPRESS	0.066	0.188	0.353	0.060
GEOGMOB	0.033	0.109	0.304	0.050
JOBSAT	0.001	0.113	0.013	0.003

INTERCEPT... 3.95094

Table IV: Multivariate Regression Results, EDMOTIV on Demographic Variables

REGRESSION ANALYSIS**********

DEPENDENT VARIABLE IS EDMOT

VARIABLE	COEFFICIENT	STANDARD ERROR OF COEFFICIENT	STUDENT'S T	D.F.
INTERCEPT	4.82415	1.28167	3.76395	34
AGE	-.465727E-1	.277218E-1	-1.68361	34
SEX	.132638	.309711	.428264	34
BIRTHPLA	-.473433	.633507	-.74732	34
RUR-URB	-.122226	.319755	-.38225	34
CSTAT	.465991	.416016	1.12013	34
INSCHL	-.854997E-1	.355617	-.240426	34
WJOB	-.267684	.383524	-.697959	34

MULTIPLE CORRELATION COEFFICIENT (R) IS .465045
0 (ADJUSTED R= .23433)
COEFFICIENT OF DETERMINATION (R^2) IS .216267

STANDARD ERROR OF ESTIMATE IS .809825
(ADJUSTED S.E. OF E.= .88929)

ANALYSIS OF VARIANCE**********

SOURCE OF VARIATION	SUM OF SQUARES	D.F.	MEAN SQUARE
REGRESSION	6.15296	7	.879994
RESIDUAL	22.2978	34	.655816
TOTAL	28.4507	41	

F RATIO IS 1.34131

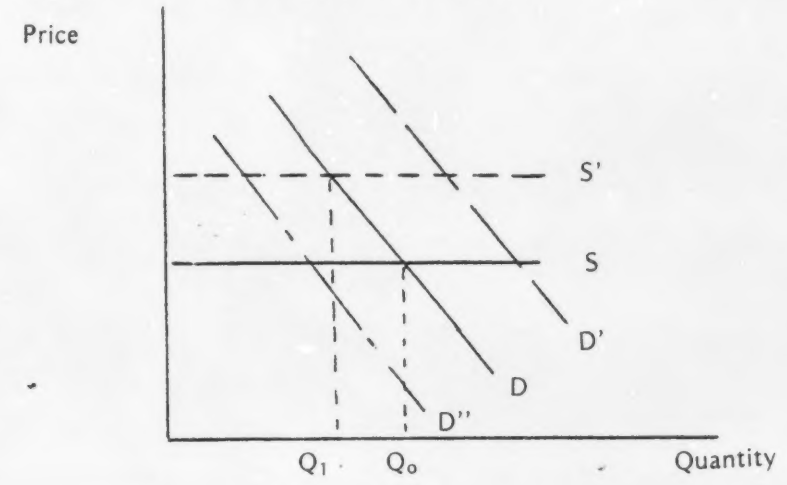
Table V: Regression Results — Factors Motivating Education

	Multivariate		Stepwise	
	Coefficient	t-value	Coefficient	t-value
DISCEXP	0.26	1.50	0.25	1.89
JOBEXP	-0.15	-0.86	-0.16	-1.07
OTHERV	0.19	1.46	0.20	0.72
EFFIC	-0.27	-1.04	-0.28	-1.29
FINL	-0.23	-1.42	-0.17	-1.25
DESHIV	-0.07	-0.64	-0.08	-0.95
PATRON	-0.13	-0.85	-0.08	-0.82

2. Demand Analysis

In the context of demand analysis, the attitudinal indices may be considered as parameters of the tastes and preferences variable. However, a full blown econometric estimation of the higher education demand function also requires data on price of education relative to prices of company training, self-study, etc., and income of the individual respondent. (See Table VI) These are difficult to piece together from the fragmentary nature of most completed questionnaires. Nevertheless, the implications of the major explanatory variables on the demand for higher education by young Filipino Americans may be qualitatively evaluated from Figure II below.

Figure II: Demand and Supply Analysis, Higher Education



Here, the supply curve is given as a perfectly price-elastic function, i.e., the higher education services available have essentially fixed prices. This long-run supply curve implies that factors other than price may be more crucial determinants of the supply, e.g., admission standards, quota systems, etc. with more rigid standards and stringent quota based on a number of disadvantage criteria reflected in an upward shift to S', thus curtailing enrollment from Q_o to Q_1.[10]

The demand curve shift parameters based on tastes and preferences include positive factors like DISCEXP and OTHERY and negative factors like JOBEXP, EFFIC, FINL, DESHIY, and PATRON. Postiive (negative, respectively) factors are those that shift D to the right (left) or from D to D' (D to D'').

The term "positive" is not used in the normative sense and hence the feeling of the existence of discrimination does not suggest a "good" standard from the point of view of higher education, i.e., this means only that larger DISCEXP indices will motivate young Filipino Americans to seek more years of advanced studies without asserting that there may be higher implicit costs, e.g., psychic costs associated with feelings of discrimination.[11]

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10. The perfectly elastic S may arise purely from the time dimension. In the long run, producers of educational services can adjust to changes in demand more favorably in output response compared to the short-run where the S curve is positively sloped, hence resulting in both price and quantity responses.

11. Of the observation of Boardman, et.al. above, p. 4.

This DISCEXP example should not be confused with the shift of S to S' which by itself may call forth a response in D to D' (independent of the DISCEXP determinants) to offset the reduction in the supply of education services brought about by higher admission standards or more stringent quota systems.

Quota systems need not imply strict proportional representation based on race alone; indeed this has been ruled by the U.S. Supreme Court in the Bakke decision as contrary to the spirit of the law. Other indicators of disadvantage may be worked into admissions formula, e.g., income levels at present and in the past, family size or number of dependents, etc., but this leaves room for administrators to consider non-disadvantage criteria as well, e.g., preference to sons and daughters of alumni, personality test scores, etc. Because of cultural biases in examinations, difficulties in adjusting to American society, etc., the latter non-disadvantage factors may in fact place at a disadvantage young Filipino Americans who are recent migrants and Philippine-educated.

Schuh and Quesada (1967) report that students in the Philippines and the U.S. see their educational environments as noticeably different, based on semantic differential ratings on concepts about "myself, the way I would most want to be, my role as a student, my faculty advisor." However, senior students in the Philippines and in the U.S. were found to have extremely similar evaluations of themselves. Schuh, Trexler, and Quesada (1969) also report that Filipino and American college students have divergent preferences for desirable working conditions; they found a greater frequency of sex differences in preferences for certain job conditions for the American cultural group.

Focusing on another demand shift parameter based on taste, it may be noted that OTHERY also has a positive relation to EDMOTIV and hence to the demand curve. This implies that more independent-minded persons who are entrepreneurially-inclined will also opt for greater education. What this may show is a belief in the cogency of education to business success, leading one to conclude that aong these entrepreneur-minded persons, an investment in a U.S. education is evidently considered as worthwhile. One would not expect such a reaction if their Philippine education were not of the consumption type.

Table VI: Factors Affecting the Demand for Higher Education

The effective demand for higher education is a function of

a. price of formal education relative to prices of company training, self-study (non-formal), etc.
   i. varies from State to State according to higher education aid, competitiveness of entry
   ii. varies by industry, firm, level of responsibility
b. income of the individual available for education
   i. number of hours worked per week; average weekly take-home pay; number of dependents
   ii. age, length of work experience
   iii. type of visa
   iv. industry; geographic location
c. tastes and preferences (surrogate for need for education)
   i. motivation for promotion
      a. target income (family size, number of dependents)
      b. education-job fit
      c. non-pecuniary rewards (prestige, being one's own boss)
      d. feeling of discrimination
      e. age
      f. length of stay in the U.S.; openness to American culture
      g. length of stay in rural area (early socialization)
   ii. consumption aspect of higher education vs. investment aspect
   iii. change field of specialization
   iv. time allocation: preference for leisure activities in hours per week
   v. peer pressure

The EFFIC index relates to OTHERY in a way but it is a more comprehensive measure of the individual's belief in his/her ability to effect changes. Surprisingly, EFFIC has a negative coefficient in the regression model while those of OTHERY are positive. EFFIC coefficients are absolutely larger than OTHERY but are less statistically significant. A mathematical explanation for the difference in signs is the relation of non-entrepreneurial measures of EFFIC to EDMOTIV.

Summary and Conclusions

When it concerns education, Filipinos are not considered by many policy proponents, e.g., the Carnegie Commission on Higher Education, as a disadvantaged group (Yoshioka, et.al., 1973.) However, the 1970 Census of Population reveals a surprisingly different enrollment pattern for young Filipino Americans which may turn out to be a major problem for one of the fastest growing minority groups in the country today. While the statistic gathered from this census show only the quantitative dimensions of the problem, some people have observed that there is a qualitative aspect of education of Filipino Americans that remains to be explored (interviews with Paula Bagasao and Artemio Lejarde, Jr.). This definitely alters the income prospects of the community in general.

Regression models of the three major Asian American groups suggest that education is not a significant explanatory variable for income levels of Filipinos unlike that of the Chinese and less so of the Japanese, even after controlling for variables that markedly impact on earnings, e.g., age, sex, and percentage on full-time workers. This may be due to the observation, which holds more strongly for newer immigrant groups perhaps, that education does not link with incomes directly; many studies have shown that occupational distribution is a major if not *the* factor explaining income levels. *A priori*, it is to be expected that years of schooling should correlate with occupational achievement and thus result in higher income levels for the Filipino community; however, the average Filipino income in the U.S. in 1970 was way below that of the average American, thus leading to the above result of the non-significance of positive education coefficients in income regression models.

This can be explained as a result of the consumption nature of the education received by most Filipinos in the Philippines, no doubt induced by business-oriented suppliers of educational services and strengthened by a culturally-sanctioned demand for formal education not necessarily in line with the economic development needs of the country. This contrasts sharply with the investment-type education desired by a typically discrimination-conscious and entrepreneurial-minded group of young respondents in the survey conducted for this research. (The exceptions to this are young females who have statistically significant non-income reasons for pursuing higher education, e.g., improved social life.)

These two types of education have a bearing on occupational achievement and hence earnings levels. For example, in the 20-24 years age cohort, Filipino males have to work more hours to achieve parity with Chinese and Japanese because relatively fewer Filipinos are in the occupational category of professional, technical, and kindred workers and managerial and administrative workers. When compared at absolute levels, however, these Filipinos have higher incomes relative to the two other Asian American groups despite their consistently lower school enrollment rates and educational attainment.

The consumption view of education that may have been carried over to the U.S. by many Filipino migrants and transmitted to their offspring is potentially damaging to those who have less intense feelings about the existence of discrimination, or any experience thereof (lower DISCEXP), and those who are less entrepreneurial in character (lower OTHERY), because the motivation to obtain further education (EDMOT) is restricted by these attitudinal factors. Likewise, the regression models show that EDMOT is significantly lower for older and married Filipinos and for those who believe in their own abilities to improve their work and income opportunities without pursuing higher formal education. While the perceived financial constraint is not statistically significant for the whole sample, it does appear to be a problem for females who in the earlier macro section are reported to be jeopardized by sex considerations alone even after controlling for the percentage employed in professional and similar high-level occupational groups.

Desire for higher incomes (DESHIY) is more marked for those reared in rural areas and it is this group that also believes in overcoming discrimination through higher education and job promotions. To the extent that recent Filipino migrants may come predominantly from urban areas in the Philippines, then the shift to investment-type of education may not materialize without proper community support, e.g., improved information on the job needs of the particular place where an individual wishes to reside so that he/she can tailor an educational program around it, obtain counseling about quality schools for specific fields, etc.

However, correcting the Filipino migrant's consumption bias in education should not be considered a panacea for race inequity in income and employment because it will not change employers' perception of their performance abilities (Dick and Medoff, 1976) nor will it lead to an automatic improvement under the market processes (Swinton, 1975). There still is the need to make discrimination a costly proposition for employers through affirmative action programs and corresponding penalties for non-compliance. There is a strong presumption that the social benefits thus generated may be worth the trouble of initiating and enforcing such programs.

Section C

Nursing Labor Market Discrimination

The last empirical study which I will discuss involves the occupational achievement link between education and income. This study is quite innovative in the sense of uncovering what may be considered the roots of discrimination: employer preferences with respect to certain work force attributes that may be inferred from employee resumes. Economists have observed that exclusion has been the main form of discrimination in labor markets (Okun, 1975, p. 77) but because of the dearth of data for Asians, as is the case for the Spanish-speaking and Native Americans, this has not been documented for minority group other than Blacks.

In the empirical section that follows, the methodology devised by Covey in studying discrimination in the resume-review phase of the job selection process is adopted. The resume-review affords an excellent example of applying labor queue concepts as in Thurow's model. Three background characteristics are tested: name (Anglo or Non-Anglo), birthplace (U.S. or the Philippines), and place of education and work experience (totally U.S., partly U.S.).

Four possible combinations of the last two characteristics were built into four dummy resumes judged by knowledgeable persons in the field of nursing as equivalent in probability of being offered at least an interview. Anglo and non-Anglo names were interchanged for each resume body in four different phases of the survey; the resulting combinations are not at all implausible based on the fact that the colonial relationship between the U.S. and the Philippines enabled some Americans to study in the Philippines although not in the same number as Filipinos who took higher education degrees in the U.S.

The research methodology then continued as follows: All four resumes were sent in response to middle management nursing positions advertised in selected major Sunday newspapers across the country for the period October 16, 1977 to March 19, 1978. Potential employer replies were then tallied accordingly as *positive* (if an offer for interview was made by letter or by phone), *negative* (if the position has been filled or if standard negative replies were received) or *none* (if no response was generated at all). In the next phase, the resume body which was used earlier with an Anglo name was then attached to the non-Anglo name

and vice-versa; responses to the new advertised positions were sent out for all four new resumes and potential employer replies were likewise tallied. In the next two phases, the names of the two other persons not used earlier were attached to the resume bodies such that through the four phases each name was used with a different resume body. This minimized the possibility of positive responses for one individual due to stronger resume qualifications not ferreted out by the resume judges.

The personal data in each resume were deliberately made similar in age, marital status (all single), etc. so that there were equal chances of every resume receiving an identical evaluation by a potential employer. Different personal data would have led to some bias especially on the basis of personal background characteristics related to marriage, child care, and family relocation. As noted above, each resume body was given the four different names (two each of Anglo and non-Anglo) across the four phases to minimize sampling bias. Discrimination would therefore be evident if certain background characteristics received more statistically significant positive responses than others.

1. RAW DATA

Based on Table VII, here are some results:

a. In terms of number of *positive* replies, the background characteristic which stands out is "All U.S. education/work experience" (A+B) with a total of 91 for all four names, followed by Anglo names (W_1 + W_2) with 90 responses for both types of education/experience and birthplace. However, white names got more positive responses than non-whites.

b. Birthplace appears irrelevant to preference orderings since 81 positive replies were recorded for the U.S. - born (A+C) as against 80 for the Philippines - born (B+D), again considering all names. As above however, white names consistently got more positive responses than non-whites.

c. Either non-Anglo name or part U.S. education/work experience reduces the chances of an individual getting the middle management job in hospital nursing since these background characteristics received 71 and 70 total positive replies respectively.

Ranking the background characteristics as above, it can be inferred that place of education/work experience and a non-Anglo name may be the more likely reasons for exclusion in this labor market based on resume reviews. The following summary preference orderings shows these striking results: all U.S. education/experience (91 positive replies), Anglo name (90), U.S.-born (81), Philippines - born (80), Filipino or non-Anglo name (71), part U.S. – part Philippines education/work experience (70).

Using the same procedure above, the following results are obtained for the number of *negative* replies: Anglo name (35), Philippines - born (39), all U.S. education/work experience (40), part U.S. - part Philippines education/work experience (41), U.S. born (42), Filipino or non-Anglo name (46).

Similarly, the number of *no* responses is as follows: part U.S. - part Philippines education/work experience (103), Filipino or non-Anglo name (97), Philippines-born (96), U.S.-born (90), Anglo name (89), all U.S. education/work experience (83).

The surprising result which can be recognized without further statistical analysis of the three types of replies is the seemingly nonsignificant role of birthplace. The raw data however suggest that this is due to the addition of the "birthplace" responses for the whites and non-whites; indeed, only in the negative responses for Philippines - born is there a very slight difference in favor of whites (20 for whites and 19 for non-whites). In fact, for the U.S. - born N always has the greater disadvantage in all three types of replies.

TABLES FROM Macaranas, Federico M., "A Job Competition Model of Discrimination in the Nursing Labor Market," *Manhattan College Journal of Business,* Vol VII., No. 1 (April 1979)

Table VII: Number of Positive, Negative, and No Replies Received, By Resume Form and Race or Name

Resume Form	W_1	W_2	N_1	N_2
All US Education/Work Experience				
A US-born	14, 2, 10 (I)	14, 4, 9 (II)	12, 5, 10 (III)	7, 6, 14 (IV)
B RP-born	13, 8, 6 (II)	10, 2, 14 (I)	11, 6, 10 (IV)	10, 7, 10 (III)
Part US Education/Work Experience				
C US-born	13, 5, 9 (IV)	8, 4, 15 (III)	7, 5, 14 (I)	6, 11, 10 (II)
D RP-born	8, 5, 14 (III)	10, 5, 12 (IV)	[illegible] 1, 16 (II)	8, 5, 13 (I)

Notation:
W_1 and W_2 are the names of Anglo applicants (Michele Crouch; Jeanette Shevlin or Jeanette Peterson).
N_1 and N_2 are the names of non-Anglo applicants (Heide Padre or Linda Macaraeg; Loretta Nazareno).
RP-born applicants are those born in the Philippines.
Roman numerals represent the phase in which the replies were received.

Table VIII: Dummy Regression Variables and Number of Positive Replies, by Resume Form and Race or Name

DEPENDENT VARIABLE: INTERCEPT RESUME FORMS				B	C	D	RACE W	INTERACTION BW	CW	DW
RESUME FORM	RACE (NAME)	Y	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8
A	W_1	14	1	0	0	0	1	0	0	0
B	W_1	13	1	1	0	0	1	1	0	0
C	W_1	13	1	0	1	0	1	0	1	0
D	W_1	8	1	0	0	1	1	0	0	1
A	W_2	14	1	0	0	0	1	0	0	0
B	W_2	10	1	1	0	0	1	1	0	0
C	W_2	8	1	0	1	0	1	0	1	0
D	W_2	10	1	0	0	1	1	0	0	1
A	N_1	12	1	0	0	0	0	0	0	0
B	N_1	11	1	1	0	0	0	0	0	0
C	N_1	7	1	0	1	0	0	0	0	0
D	N_1	10	1	0	0	1	0	0	0	0
A	N_2	7	1	0	0	0	0	0	0	0
B	N_2	10	1	1	0	0	0	0	0	0
C	N_2	6	1	0	1	0	0	0	0	0
D	N_2	8	1	0	0	1	0	0	0	0

Table IX: Results, Regression of Positive Replies on Dummy Variables for Resume Forms and Race or Name

A. STEPWISE REGRESSION

Variable	Regression Coefficient	Standard Error Of Coefficient	Computed Value Of Student's T	BETA Coefficient
FORMC	−3.000	2.279	−1.316	−0.517
WRACE	2.750	1.974	1.393	0.547
BW	−1.750	3.015	−0.580	−0.230
FORMB	1.000	2.279	0.439	0.172
FORMD	−0.500	2.279	−0.219	−0.086
CW	0.250	4.414	0.057	0.033

B. MULTIPLE REGRESSION

DEPENDENT VARIABLE IS YREPLIES

Variable	Coefficient	Standard Error Of Coefficient	Student's T	D.F.
INTERCEPT	9.5	1.70935	5.55767	8
FORMB	.999999	2.41739	.+1367	8
FORMC	− 3	2.41739	−1.24101	8
FORMD	−.500001	2.41739	−.206835	8
WRACE	2.75	2.09352	1.31358	8
BW	− 1.75	3.1979	−.547234	8
CW	1.46429	4.68125	.312799	8
DW	−1.21429	0	0	8

MULTIPLE CORRELATION COEFFICIENT (R) IS .732695
(ADJUSTED R = .362738)
COEFFICIENT OF DETERMINATION (R^2) IS .536842
STANDARD ERROR OF ESTIMATE IS 2.41739
(ADJUSTED S.E. OF E. = 3.31014)

The rankings above control for one variable as two of the three background characteristics are considered at the same time. Using the raw data for the two 2x2 matrices, the above results are strengthened e.g., considering the positive replies the ranking from the highest to the lowest always favor W except for the place of education/work experience where N has 40 and W has 39. Note the ranking of replies: 59, 49, 41, 40, 39, 32, 31.

2. CONFIDENCE INTERVALS

More rigorous statistical statements concerning the discriminatory impact of resume evaluation on background characteristics can be made from confidence interval estimates instead of using X^2 tests. Wonnacott and Wonnacott (1977, pp. 513-515) present an estimation procedure which escapes the shortcomings of the X^2 test – its inability to exploit the numerical nature of the data even if they are merely ordered and "not naturally numerical" (p. 515). This alternative procedure invovles estimating two proportions (a true and a null proportion) and using these to construct confidence intervals.

As an illustration, let us test for the discriminatory impact of the resume evaluation on names. Let the null hypothesis be that non-Anglo names are not treated any differently than Anglo names, i.e., the number of positive replies for Filipino names are equal to those of the American names (out of 214 potential positive replies), or

$$(2)\ \text{Null}\ \pi = 90/214 =$$

Let the true proportion be the same proportion of positive replies observed for Filipino names, or

$$(3)\quad P = 71/214 = 0.3318$$

Then, the 95% confidence interval for the corresponding total potential positive replies is, using the equation

$$\pi = P + 1.96 \sqrt{P(1-P)/n}$$

$$(4)\ \text{True}\ \pi = 0.3318 \pm 1.96\ (0.3318)\ (0.6682)/214$$
$$= 0.3318 \pm 0.0631$$

The ratio of (4) to (2) gives a range of 0.639 to 0.939 since (5) True π /Null π = (0.338 ± 0.0631)/0.4206 which can now be interpreted as follows: resumes with Filipino names tend to receive fewer positive replies than those with Anglo names. More precisely, it can be said with 95% confidence that Filipino names receive 64% to 94% positive replies as American names, not controlling for place of birth and place of education and work experience.

Adopting the same procedures, the following results are arrived at given a 95% confidence interval once more. Resumes with part-Philippines education/work experience receive 62.1% to 91.7% of the positive replies of those with all U.S. education and work experience despite the fact that these resumes include whites. However, resumes of applicants born in the Philippines are not discriminated against because the ratio of the true π to the null π ranges from 81.6% to 115.9%; this may however be due to the race factor which this technique has not fully controlled for, i.e. the result is biased by the inclusion of whites born in the Philippines. The next section is aimed at avoiding this bias.

3. REGRESSION WITH DUMMY VARIABLES

To ascertain the differential impact of positive responses on the various resume forms (containing different birthplaces and places of education/work experience), name types and the interaction between these two, a matrix of dummy variable regressors presented in Table VIII may be analyzed. To avoid linear dependence among the independent variables, one dummy variable is dropped from each set (Johnston, 1972, p. 178). Using the notation $E(Y/A, W_1)$ to indicate the expected number of positive responses given resume A and the first Anglo name W_1, the following relationships may be derived:

$$
\begin{array}{lllllllll}
\text{(2-a)} & E(Y_1 A, W_1) & = & E(Y_1 A, W_2) & = & B_1 + B_5 & & & \\
\text{(2-b)} & E(Y_1 B, W_1) & = & E(Y_1 B, W_2) & = & B_1 + B_2 + B_5 + B_6 & & & \\
\text{(2-c)} & E(Y_1 C, W_1) & = & E(Y_1 C, W_2) & = & B_1 + B_3 + B_5 + B_7 & & & \\
\text{(2-d)} & E(Y_1 D, W_1) & = & E(Y_1 D, W_2) & = & B_1 + B_4 + B_5 + B_8 & & & \\
\text{(2-e)} & E(Y_1 A, N_1) & = & E(Y_1 A, N_2) & = & B_1 & & & \\
\text{(2-f)} & E(Y_1 B, N_1) & = & E(Y_1 B, N_2) & = & B_1 + B_2 & & & \\
\text{(2-g)} & E(Y_1 C, N_1) & = & E(Y_1 C, N_2) & = & B_1 + B_3 & & & \\
\text{(2-h)} & E(Y_1 D, N_1) & = & E(Y_1 D, N_2) & = & B_1 + B_4 & & &
\end{array}
$$

Since our interest is in the differential effect of name types (or race) using the various forms, we then have the following results:

$$
\begin{array}{llll}
\text{(3-a)} & B_5 + B_1 & = \text{(2-a)} - \text{(2-e)} & = \text{differential effect of race on form A} \\
\text{(3-b)} & B_5 + B_6 & = \text{(2-b)} - \text{(2-f)} & = \text{differential effect of race on form B} \\
\text{(3-c)} & B_5 + B_7 & = \text{(2-c)} - \text{(2-g)} & = \text{differential effect of race on form C} \\
\text{(3-d)} & B_5 + B_8 & = \text{(2-d)} - \text{(2-h)} & = \text{differential effect of race on form D}
\end{array}
$$

Likewise, the resume differential effect on name types (or race) can be derived as

$$
\begin{array}{llll}
\text{(4-a)} & B_2 + B_6 & = \text{(2-b)} - \text{(2-a)} & = \text{differential effect of resume form B over A for W} \\
\text{(4-b)} & B_3 + B_7 & = \text{(2-c)} - \text{(2-a)} & = \text{differential effect of resume form C over A for W} \\
\text{(4-c)} & B_4 + B_8 & = \text{(2-d)} - \text{(2-a)} & = \text{differential effect of resume form D over A for W} \\
\text{(4-d)} & B_2 & = \text{(2-f)} - \text{(2-e)} & = \text{differential effect of resume form B over A for N} \\
\text{(4-e)} & B_3 & = \text{(2-g)} - \text{(2-e)} & = \text{differential effect of resume form C over A for N} \\
\text{(4-f)} & B_4 & = \text{(2-h)} - \text{(2-e)} & = \text{differential effect of resume form D over A for N}
\end{array}
$$

Two regression results are presented in Table IX. The stepwise regression program stopped after selecting the sixth variable, leaving behind the resume D – race interaction term; the other multiple regression model shows that this variable has a zero student's t which in regression with dummy variables severs to compare the treatment with the control group men, in this case resume A (Kerlinger and Pedhazur, 1973, p. 121).

The race dummy B_5 appeared as the most statistically significant among the independent variables except for the intercept term in the second multiple regression. None of the results for equations (4-a) to (4-f) deserve close scrutiny because of the generally lower levels of significance of the coefficients.

The expected number of positive replies for W based on equations (2-a) to (2-d) are as follows: 12.25, 11.50, 10.71 and 10.54 respectively. The corresponding replies for N based on equations (2-e) to (2-h) are 9.50, 10.50, 6.50 and 9.00 similarly. Note that the greatest differences, as in equations (3-a) to (3-e), are in resume forms A and C, suggesting that the non-Anglo-named applicants born in the U.S. (e.g., Filipino Americans with Filipino surnames) suffer more from adverse resume evaluation compared to those with Anglo names. This is particularly more pronounced if education and work experience are not wholly in the United States.

Using the four resume forms, the confidence interval for the average population difference between the paired samples W and N is given by (5-a) for two tails at 5% significance level:

$$(5\text{-a}) \quad \Delta = 2.375 \pm 3.182\ (2.032)$$

This gives a range of −4.09 to 8.84 which indicates that with 95% confidence, we may expect the differences in positive responses to fall within these bounds. From the earlier observations, it is evident that for the U.S.-born subgroup (difference between W and N), this range will be different; in fact, the confidence interval is

$$(6\text{-a}) \quad \Delta = 1.27 \pm 3.182\ (1.065)$$

which gives a range from +0.09 to + 6.87 in contrast to the Philippines-born confidence interval.

$$(6\text{-b}) \quad \Delta = 1.27 \pm 3.182\ (0.146)$$

which yields a range of −0.80 to 1.43 also at 95% confidence level.

Based on the three confidence intervals, it can be concluded that racial discrimination at the resume evaluation phase of the job competition process in the middle management market for nurses exists and that the disadvantage of a non-Anglo name is more significant for those born here in the U.S.

APPENDIX

Table A-1: Comparative Percentage Enrollment, Filipinos, Chinese, and Japanese, by Region and Selected Age Brackets, 1970

	TOTAL	URBAN	RURAL NON-FARM	RURAL FARM
FILIPINOS				
25-34 years	6.9	7.1	4.6	1.7
18-24 years				
Male	27.5	28.6	21.1	17.8
Female	23.2	23.5	19.6	42.0
14-17 years				
Male	92.9	92.9	92.8	90.1
Female	92.6	92.3	93.2	100.0
CHINESE				
25-34 years	18.3	18.5	11.1	. . .
18-24 years				
Male	70.8	71.1	62.0	. . .
Female	58.2	58.5	48.1	. . .
14-17 years				
Male	95.3	95.5	88.7	. . .
Female	95.2	95.3	94.1	. . .
JAPANESE				
25-34 years	9.8	10.1	6.5	5.2
18-24 years				
Male	55.6	56.6	40.7	61.1
Female	48.4	49.0	33.8	63.1
14-17 years				
Male	96.3	96.7	93.4	95.3
Female	96.2	96.3	95.2	98.1

Source of Data: U.S. Department of Commerce, 1970 Census of Population, Subject Report, PC(2)-1G

Table A-2: Enrollment Rates, Other Education Data, and Population Frequency Distribution of Filipinos, by Region and Selected Age Groups, 1970

	U.S.	N.E.	N.C.	S.	W.
A. Enrollment Rates					
25-34 years	6.9	8.2	9.0	5.8	6.4
18-24 years	25.2	20.4	21.4	15.0	28.1
Male	27.5	26.4	30.2	11.6	30.8
Female	23.2	17.4	17.7	21.1	25.5
14-17 years	92.8	38.8	92.9	92.5	92.9
Male	92.9	98.4	88.8	90.6	92.9
Female	92.6	82.5	97.3	94.8	92.9
25 years and over:					
Median school years completed	12.2	15.5	16.5	12.8	11.4
Percent high school graduates	54.7	72.7	81.7	67.5	47.4
B. Population Distribution (in %)					
25-34 years	18.91	2.82	2.33	2.37	11.38
18-24 years	11.75	1.26	1.01	1.32	8.17
14-17 years	6.37	0.27	0.23	0.28	5.59
14-34 years	37.03	4.35	3.57	3.97	25.14
All Ages	100.00	8.98	8.10	8.69	74.23
C. Enrollment Rates: Urban Areas Only					
25-34 years	7.1	7.9	9.1	6.0	6.8
18-24 years					
Male	28.6	30.0	29.3	12.5	31.9
Female	23.5	17.9	17.8	21.8	26.0
14-17 years					
Male	92.9	98.2	90.3	91.6	92.9
Female	92.3	80.9	97.2	94.4	92.8
25 years and over:					
Median school years completed	12.4	15.7	16.5	12.8	12.1
Percent high school graduates	58.9	73.1	82.6	68.4	52.0
D. Enrollment Rates: Rural Non-Farm only					
25-34 years	4.6	14.3	6.2	2.8	3.8
18-24 years					
Male	21.1	8.0	....	5.3	24.8
Female	19.6	9.3	16.8	14.6	21.1
14-17 years					
Male	92.8	....	....	....	93.1
Female	93.2	....	....	....	92.3
25 years and over:					
Median school years completed	8.0	12.9	12.9	12.4	7.1
Percent high school graduates	31.9	66.6	68.7	58.9	27.2

Source of Basic Data: U.S. Dept. of Commerce, 1970 Census of Population Subject Reports, PC(2)-1G

Table A-3: Individual Income, Education, and Related Socio-Economic Variables By Age Brackets, Filipinos, 1970

	14-15		16-19		20-24		25-34		35-44		45-64		65+		Total 16 yrs. and over	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1. Mean Income	$895	$944	$1382	$1271	$3439	$3187	$6352	$4704	$8525	$4754	$6418	$4187	$3228	$1701	$5710	$4013
2. Median Income	660	639	936	809	2857	2997	5897	4496	6968	4110	5973	3558	2528	1130	5019	3513
3. Median school years completed	8.5	8.6	11.0	11.1	12.7	13.0	13.1	14.4	12.7	12.6	7.9	10.1	5.4	5.9	11.9	12.6
4. % high school graduates	0.1	0.1	27.4	31.9	74.2	81.5	78.8	78.2	68.2	64.9	26.5	41.8	17.3	16.6	49.4	63.6
5. % professional, technical, kindred workers; managers & administrators except farm	5.9	6.6	3.7	6.3	16.9	30.7	39.1	45.3	33.7	30.0	8.3	21.5	6.0	24.3	21.2	37.5
6. % private wage and salary workers	83 9	83.9	86.7	86.7	82.8	82.8	81.1	81.1	74.3	74.3	73.9	73.9	78.3	78.3	78.1	78.1
7. % self-employed and unpaid family workers	5.4	5 4	0.7	0.7	1.0	1.0	1.8	1.8	4.4	4.4	5.7	5.7	9.2	9.2	3.6	3.6
8. % not in labor force	90.6	94.9	56.	63.4	13.3	37.4	5.6	39.8	5.1	37.6	12.9	47.8	67.9	88.6	21.0	41.8
9. % worked 26 weeks or less	78.6	84.2	67.1	74.2	19.8	31.7	8.2	22.6	6.0	19.4	7.2	17.8	30.9	36.0	14.0	26.7
10. % single	98.5	98.9	94.3	87.8	67.8	48.6	24.1	22.3	9.9	10.1	17.6	7.8	28.0	9.8	31.0	27.5
11. % lived in same house in 1965	52.1	52.1	45.2	45.2	48.1	48.1	13.4	13.4	29.9	29.9	55.0	55.0	59.6	59.6	33.5	33.5
12. #2/#3 (in %)	77.6	74.3	85.1	72.9	225.0	230.5	450.2	312.2	548.7	326.2	756.1	352.3	468.1	191.6	421.8	278.8

Table A-4: Individual Income, Education, and Related Socio-Economic Variables By Age Brackets, Chinese, 1970

	14-15		16-19		20-24		25-34		35-44		45-64		65+		Total 16 yrs. and over	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1. Mean Income	$669	$722	$1277	$1154	$2650	$2486	$7458	$4472	$9951	$4493	$8842	$4294	$3348	$1918	$6877	$3512
2. Median Income	644	630	916	856	1985	1889	6887	4090	8643	3988	6904	3464	1943	1188	5223	2686
3. Median school years completed	8.6	8.7	11.5	11.6	14.0	13.8	16.1	13.6	12.9	12.3	11.5	9.5	6.7	4.4	12.6	12.3
4. % High school graduates	0.3	0.2	41.9	43.5	89.1	85.4	85.3	78.1	69.2	59.3	47.9	42.0	21.3	15.5	62.2	58.3
5. % professional, technical, kindred workers; managers & administrators except farm	4.3	5.9	6.3	4.3	26.4	19.8	56.3	39.9	45.5	21.9	35.4	18.6	29.7	15.2	40.1	23.2
6. % private wage and salary workers	80.3	80.2	79.9	79.9	74.8	74.8	71.4	71.4	68.9	68.9	65.5	65.5	88.0	88.0	69.9	69.9
7. % self-employed and unpaid family workers	13.9	13.9	5.5	5.5	2.8	2.8	5.1	5.1	12.5	12.5	18.4	18.4	25.0	25.0	11.1	11.1
8. % not in labor force	87.4	92.9	62.5	65.5	42.0	44.3	13.3	49.7	4.5	40.9	12.2	42.6	75.2	88.0	26.8	50.5
9. % worked 26 weeks or less	61.5	67.2	61.9	64.8	43.5	41.1	10.9	23.5	4.3	16.5	6.2	13.7	21.3	27.1	17.0	27.6
10. % single	99.3	99.4	98.0	95.3	88.4	68.2	35.7	14.6	12.2	5.3	8.9	4.3	12.1	5.3	36.7	27.7
11. % lived in same house in 1965	58.1	58.1	49.9	49.9	29.2	29.2	21.4	21.4	44.8	44.8	60.4	60.4	60.7	60.7	43.2	43.2
12. #2/#3 (in %)	74.9	72.4	79.7	73.8	141.8	136.9	427.8	300.7	670.0	324.2	600.3	364.6	290.0	270.0	414.5	218.4

Table A-5: Individual Income, Education, and Related Socio-Economic Variables By Age Brackets, Japanese, 1970

	14-15		16-19		20-24		25-34		35-44		45-64		65+		Total 16 yrs. and over	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1. Mean Income	$741	$929	$1354	$1020	$3345	$2953	$8382	$4798	$11261	$4567	$10670	$4623	$3984	$1928	$8183	$3819
2. Median Income	612	664	950	770	2639	2448	8316	4893	10515	4189	9344	4192	2482	1312	7574	3236
3. Median school years completed	8.7	8.7	11.4	11.5	13.9	14.0	14.6	12.9	12.9	12.5	12.3	12.2	8.5	8.3	12.6	12.4
4. % high school graduates	0.1	0.2	37.8	39.7	93.2	93.4	92.6	86.6	85.8	78.8	63.2	58.2	27.3	25.4	69.9	67.4
5. % professional, technical, kindred workers; managers & administrators except farm	1.4	4.3	4.1	5.2	21.1	22.8	46.3	32.6	42.9	18.1	27.4	15.7	19.1	11.2	33.2	19.7
6. % private wage and salary workers	88.9	88.9	86.9	86.9	73.9	73.9	69.7	69.7	67.6	67.6	64.7	64.7	63.4	63.4	68.5	68.5
7. % self-employed and unpaid family workers	6.4	6.4	2.5	2.5	2.3	2.3	4.9	4.9	9.9	9.9	17.4	17.4	30.3	30.3	11.1	11.1
8. % not in labor force	89.2	94.9	59.0	67.3	27.3	36.8	8.5	51.1	3.1	47.3	6.5	37.3	70.7	88.0	30.7	50.6
9. % worked 26 weeks or less	69.3	81.2	66.6	71.5	33.1	35.0	7.4	20.5	1.8	16.9	2.2	10.5	22.6	40.5	12.7	22.7
10. % single	99.3	98.6	97.9	95.0	81.1	62.4	35.1	14.2	14.1	5.7	9.2	6.7	7.2	1.3	31.9	20.2
11. % lived in same house in 1965	70.2	70.2	63.5	63.5	34.8	34.8	24.7	24.7	50.4	50.4	73.6	73.6	75.2	75.2	54.1	54.4
12. #2/#3 (in %)	70.3	76.3	83.3	67.0	189.9	174.9	569.6	379.3	815.1	335.1	759.7	343.6	292.0	158.1	601.1	261.0

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